



CTSO Course Alignments: Plant and Soil Science

Below you will find standards for the Plant and Soil Science course aligned with competitive events from appropriate career and technical student organizations (CTSOs). Knowing the aligned events for your organization will allow you to have additional tools for teaching course standards, as well as increase student engagement and preparation in your CTSO activities. The final column recommends potential tools from other CTSO organizations. Even if your students are not participating in these organizations, available rubrics, tools, and materials can also add to the instructional resources at your disposal for best teaching your content.

Important to note: While the aligned activities below can be important tools in teaching course standards, it is important to note that events may not cover a standard in its entirety and should not be the sole instructional strategy used to address a standard.

	STANDARD	ALIGNED FFA COMPETITIVE EVENTS/PROGRAMS	OTHER POTENTIAL CTSO TOOLS & RESOURCES
1	Determine the role of plants and soil in maintaining environmental quality. Trace the history of soil conservation in the United States by developing an informational essay or graphic, citing specific historical events that promoted the development of soil conservation methodologies found in academic journals and news media. (TN Reading 1, 2; TN Writing 4, 7, 9)	<ul style="list-style-type: none"> • FFA Environmental and Natural Resources, Land Evaluation 	
2	Review common laboratory safety procedures for tool and equipment operation in the agricultural and biosystems engineering laboratories, including but not limited to accident prevention and control procedures. Demonstrate the ability to follow safety and operational procedures in a lab setting and complete a safety test with 100 percent accuracy. (TN Reading 3; ARNR CS)		<ul style="list-style-type: none"> • HOSA: Biomedical Laboratory Science • SkillsUSA: Occupational Health and Safety • TSA: Biotechnology Design
3	Use local news media, organizational websites, and real-time labor market information to investigate occupations in plant and soil sciences. Compare and contrast the knowledge, skills, and abilities necessary for employment, as well as the typical level of education required. (TN Reading 2, 9; TN Writing 4, 7, 9)	<ul style="list-style-type: none"> • FFA: Job Interview 	<ul style="list-style-type: none"> • FCCLA: Job Interview, Career Investigation, Entrepreneurship • HOSA: Job Seeking Skills • SkillsUSA: Job Interview, Entrepreneurship, Employment Application Process • TSA: Career Preparation

4	Review common laboratory safety procedures for tool and equipment operation in plant and soil science laboratories, including but not limited to accident prevention and control procedures. Demonstrate the ability to follow safety and operational procedures in a lab setting and complete a safety test with 100 percent accuracy. (TN Reading 3)		<ul style="list-style-type: none"> • HOSA: Biomedical Laboratory Science • SkillsUSA: Occupational Health and Safety • TSA: Biotechnology Design
5	Create a model or illustration that depicts the formation of soil. Differentiate between the biological, geological, chemical, and physical factors and processes involved in soil formation. (TN Reading 2, 7; TN Writing 4, 9; TN Environmental Science 1)	<ul style="list-style-type: none"> • FFA: Land Evaluation 	<ul style="list-style-type: none"> • HOSA: Extemporaneous Health Poster • TSA: Desktop Publishing, Promotional Graphics
6	Communicate understanding of methods for classifying soils by preparing a guide that accurately describes the procedures for each method using domain specific language. Demonstrate the ability to follow methods for sampling and analyzing the following: soil pH, texture, permeability, water holding capacity, slope, chemical analyses, and soil organisms. (TN Reading 1, 2, 3, 4; TN Writing 4, 7, 9; TN Environmental Science 1)	<ul style="list-style-type: none"> • FFA: Land Evaluation 	<ul style="list-style-type: none"> • TSA: Desktop Publishing
7	Conduct soil profiles, soil analysis, and water availability analysis. Synthesize findings in an argumentative essay. Develop a claim justifying appropriate agricultural, recreational, conservational, and/or aesthetic uses of specific land areas using valid reasoning and citing specific evidence gathered in analyses. (TN Reading 3; TN Writing 1, 4, 7, 9)	<ul style="list-style-type: none"> • FFA: Agronomy, Environmental and Natural Resources, Land Evaluation 	
8	Compare and contrast the anatomy and physiology of monocot and dicot plants used for crop production. (TN Reading 2, 5)	<ul style="list-style-type: none"> • FFA: Agriscience Fair 	<ul style="list-style-type: none"> • HOSA: Extemporaneous Writing • TSA: Extemporaneous Presentation
9	Create a model depicting the parts and functions of plant cells. Label the structures and describe the functions of plant cell organelles. (TN Reading 2, 4, 7; TN Writing 4; TN Biology I 1; TN Biology II 1, 7)	<ul style="list-style-type: none"> • FFA: Agriscience Fair 	
10	Assess the importance of the 16 (sixteen) nutrients essential to plant growth and development. Identify nutritional deficiencies and disorders, distinguish among signs of nutrient deficiency in plants, make recommendations for appropriate treatments, and prescribe preventative control measures for major agricultural crops, including corn, soybean, cotton, tobacco, hay, pasture, and forest. (TN Reading 2, 5; TN Writing 2, 4, 9; TN Biology II 7)	<ul style="list-style-type: none"> • FFA: Agriscience Fair, Agronomy, Land Evaluation 	

11	Investigate the use of fertilizers as a source of essential plant nutrients. Compare and contrast the use of organic and chemical fertilizers, assessing claims made by producers and consumers of fertilizer products found in promotional materials, news articles, and academic journals. Calculate fertilizer formulations and perform various methods of fertilizer application for crops, such as erosion controlling crops. (TN Reading 1, 3, 6, 8; TN Mathematics N-Q,)	<ul style="list-style-type: none"> • FFA: Agriscience Fair, Agronomy, Land Evaluation 	
12	Research, compare and contrast traditional, sustainable, and organic agriculture methods and practices. Describe how each method aligns to a specific goal, including but not limited to the following: soil fertility and texture maintenance, adequate soil moisture maintenance, erosion prevention, pollution prevention, and weed, insect, and disease management. Assess the costs and benefits of specific methods and practices. (TN Reading 2, 4, 5, 9; TN Environmental Science 2, 4, 6)	<ul style="list-style-type: none"> • FFA: Agronomy, Land Evaluation 	
13	Identify major agriculture-related pollutants and isolate practices that contribute to the spread of pollution in both urban and traditional agricultural production environments. Develop a list of best practices, citing technical texts to make recommendations for watering procedures, runoff containment, pest control, and chemical use and disposal in both domestic (home) and agricultural production settings. Prepare informational materials emphasizing the importance of using recommended best practices to reduce pollution. (TN Reading 2, 5; TN Writing 4, 7, 9; TN Environmental Science 4, 6, 7)	<ul style="list-style-type: none"> • FFA: Agricultural Issues 	<ul style="list-style-type: none"> • FCCLA: Advocacy, Environmental Ambassador
14	Compare and contrast alternative methods for maintaining home landscapes using sustainable and/or organic products that will reduce pollution and soil erosion and conserve water and energy. Develop an argumentative essay that develops a claim about the need for a specific practice to maintain a healthy home landscape, developing claim(s) and counterclaim(s) with reasoning and evidence. (TN Reading 5, 9; TN Writing 1, 4, 7, 9; TN Environmental Science 2, 4, 6, 7)	<ul style="list-style-type: none"> • FFA: Nursery and Landscape 	<ul style="list-style-type: none"> • FCCLA: Advocacy, Environmental Ambassador • HOSA: Biomedical Debate, Researched Persuasive Speaking • TSA: Debating Technological Issues
15	Research the use of compost and mulch in improving and rebuilding soils. Create a presentation or resource guide describing various compost methods, including field crop composting, commercial composting, backyard compost piles, vermicomposting, and bokashi. Create a chart that compares the inputs, time investment, quality, and quantity of compost prepared by each method. (TN Reading 2, 4, 7; TN Writing 4, 7, 9; TN Ecology 4, 6; TN Environmental Science 4, 6)	<ul style="list-style-type: none"> • FFA: Nursery and Landscape 	<ul style="list-style-type: none"> • TSA: Desktop Publishing
16	Determine characteristics important in selecting a site for optimal growth of plants and crops in rural, suburban, and urban settings. Describe the factors that influence the economics of crop production in each setting. (TN Reading 2; TN Writing 4, 9; TN Environmental Science 2, 4)	<ul style="list-style-type: none"> • FFA: Nursery and Landscape 	<ul style="list-style-type: none"> • HOSA: Extemporaneous Writing • TSA: Debating Technological Issues

ALL	CAN BE USED WITH ALL/MOST STANDARDS	<ul style="list-style-type: none">• FFA: Agriscience Fair	<ul style="list-style-type: none">• FCCLA: Illustrated Talk, Chapter in Review Display, Chapter in Review Portfolio• HOSA: Prepared Speaking• SkillsUSA: Career Pathways Showcase, Job Skills Demonstration A, Job Skills Demonstration O, Prepared Speech, Extemporaneous Speaking, Chapter Display• TSA: Prepared Presentation
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